Chemical Analysis Report

NE-DIST-2022-10-20-01

Florida DEP Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Butcher pen SMP**
Request ID: **RQ-2022-10-17-11**
Customer: **NE-DIST**
Project ID: **SMP**

Send Reports to:
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8800 Baymeadows Way West
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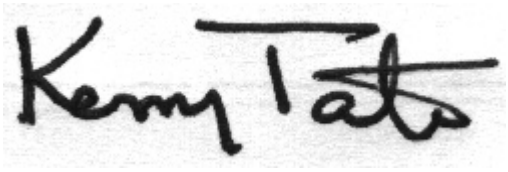
Date Certified: 09-NOV-2022 11:18



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: BUTCHER PEN CR @ CONFEDERATE PT ROAD **Collection Date/Time: 10/19/2022 09:50**

Field ID: 20030082 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363980	DEP SOP: NU-094-1	Color (true)	69	A	PCU	P421193	
	EPA 180.1 Rev. 2.0	Turbidity	5.0	A	NTU	P421207	
	EPA 300.0 Rev. 2.1	Chloride	530		mg Cl/L	P421654	
		Sulfate	83		mg SO4/L	P421823	
	SM 2320 B-2011	Total Alkalinity	98		mg CaCO3/L	P421457	
	SM 2540 C-2015	TDS	1.14E+03		mg/L	P421735	
	SM 2540 D-2015	TSS	8	I	mg/L	P421401	
	SM 4500-F- C-2011	Fluoride	0.16		mg F/L	P421906	
2363981	EPA 350.1 Rev. 2.0	Ammonia-N	0.009		mg N/L	P421858	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P421505	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P421528	
	EPA 365.1 Rev. 2.0	Total-P	0.16		mg P/L	P421344	
	SM 5310 B-2011	Organic Carbon	12		mg C/L	P421543	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Butcher Pen Confederate **Collection Date/Time: 10/19/2022 10:00**

Field ID: EB_10192022 Matrix: W-EQPMT-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363982	DEP SOP: NU-094-1	Color (true)	2.5	U	PCU	P421193	
	EPA 180.1 Rev. 2.0	Turbidity	0.10	U	NTU	P421207	
	EPA 300.0 Rev. 2.1	Chloride	0.20	U	mg Cl/L	P421654	
		Sulfate	0.20	U	mg SO4/L	P421823	
	SM 2320 B-2011	Total Alkalinity	0.65	U	mg CaCO3/L	P421457	
	SM 2540 C-2015	TDS	15	U	mg/L	P421735	
	SM 2540 D-2015	TSS	2	U	mg/L	P421401	
	SM 4500-F- C-2011	Fluoride	0.025	U	mg F/L	P421906	
2363983	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P421858	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P421505	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P421528	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P421344	
	SM 5310 B-2011	Organic Carbon	0.50	U	mg C/L	P421543	

Ref. Method and Comment:
SM 2540 D-2015: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: BUTCHER PEN CR AT WESCONNETT **Collection Date/Time: 10/19/2022 10:15**

Field ID: 20030760 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2363986	EPA 200.7 Rev. 4.4	Calcium	38.4		mg/L	P421233	
		Iron	1.06E+03		ug/L	P421233	
		Magnesium	6.18		mg/L	P421233	
		Potassium	2.3		mg/L	P421233	
		Sodium	15.4		mg/L	P421233	
		Strontium	606		ug/L	P421233	
		Tin	4.4	I	ug/L	P421233	
		Titanium	1.2	I	ug/L	P421233	
		Vanadium	2.0	U	ug/L	P421233	
		Zinc	6.2	I	ug/L	P421233	
	EPA 200.8 Rev. 5.4	Aluminum	54		ug/L	P421233	
		Antimony	0.12	I	ug/L	P421233	
		Arsenic	0.82		ug/L	P421233	
		Barium	31.0		ug/L	P421233	
		Beryllium	0.010	U	ug/L	P421233	
		Boron	38.2		ug/L	P421233	
		Cadmium	0.020	U	ug/L	P421233	
		Chromium	0.47	I	ug/L	P421233	
		Cobalt	0.092		ug/L	P421233	
		Copper	0.70	I	ug/L	P421233	
		Lead	0.34	I	ug/L	P421233	
		Manganese	22.4		ug/L	P421233	
		Molybdenum	0.60	I	ug/L	P421233	
		Nickel	0.50	U	ug/L	P421233	
		Selenium	0.20	U	ug/L	P421233	
		Silver	0.010	U	ug/L	P421233	
		Thallium	0.10	U	ug/L	P421233	
	SM 2340 B-2011	Hardness	121		mg/L	P421233	

Quality Assurance Report
Method Blank Results

Reference Method: DEP SOP: NU-094-1
Batch ID: P421193

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421207

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Strontium	2.0	U	ug/L
Tin	3.0	U	ug/L
Titanium	0.75	U	ug/L
Vanadium	2.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Barium	0.20	U	ug/L
Beryllium	0.010	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Cobalt	0.020	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Manganese	0.10	U	ug/L
Molybdenum	0.15	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Quality Assurance Report
Method Blank Results

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421528

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421344

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: SM 2320 B-2011
Batch ID: P421457

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 C-2015
Batch ID: P421735

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-2015
Batch ID: P421401

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Component	Result	Code	Units
Fluoride	0.025	U	mg F/L

Quality Assurance Report
Method Blank Results

Reference Method: SM 5310 B-2011
Batch ID: P421543

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: DEP SOP: NU-094-1
Batch ID: P421193

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	97.9		P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Turbidity	99.1		P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	104		P	80 - 120
Iron	105		P	80 - 120
Magnesium	105		P	80 - 120
Potassium	104		P	80 - 120
Sodium	96.9		P	80 - 120
Strontium	106		P	80 - 120
Tin	104		P	80 - 120
Titanium	100		P	80 - 120
Vanadium	99.9		P	80 - 120
Zinc	99.8		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	93.7		P	85 - 115
Antimony	98.4		P	85 - 115
Arsenic	101		P	85 - 115
Barium	101		P	85 - 115
Beryllium	91.7		P	85 - 115
Boron	99.6		P	85 - 115
Cadmium	96.7		P	85 - 115
Chromium	95.6		P	85 - 115
Cobalt	94.1		P	85 - 115
Copper	95.5		P	85 - 115
Lead	93.0		P	85 - 115
Manganese	95.4		P	85 - 115
Molybdenum	95.2		P	85 - 115
Nickel	95.5		P	85 - 115
Selenium	97.0		P	85 - 115
Silver	100		P	85 - 115
Thallium	97.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	102		P	90 - 110

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	97.8		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	103		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421528

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421344

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	104		P	90 - 110

Reference Method: SM 2320 B-2011
Batch ID: P421457

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	99.0		P	94 - 106

Reference Method: SM 2540 C-2015
Batch ID: P421735

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TDS	97.9		P	90 - 110

Reference Method: SM 2540 D-2015
Batch ID: P421401

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
TSS	96.5		P	85 - 106

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	100		P	96 - 104

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P421543

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	97.8		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362992	Calcium	101	102	P/P	80 - 120
2362992	Iron	103	104	P/P	80 - 120
2362992	Magnesium	104	105	P/P	80 - 120
2362992	Potassium	100	101	P/P	80 - 120
2362992	Sodium	94.6		P	80 - 120
2362992	Strontium	104	104	P/P	80 - 120
2362992	Tin	102	105	P/P	80 - 120
2362992	Titanium	99.5	103	P/P	80 - 120
2362992	Vanadium	99.7	103	P/P	80 - 120
2362992	Zinc	98.9	102	P/P	80 - 120
2363965	Calcium	107		P	80 - 120
2363965	Iron	108		P	80 - 120
2363965	Magnesium	111		P	80 - 120
2363965	Potassium	107		P	80 - 120
2363965	Sodium	107		P	80 - 120
2363965	Strontium	101		P	80 - 120
2363965	Tin	103		P	80 - 120
2363965	Titanium	98.4		P	80 - 120
2363965	Vanadium	97.6		P	80 - 120
2363965	Zinc	98.5		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2362992	Aluminum	93.7	92.8	P/P	80 - 120
2362992	Antimony	99.1	99.1	P/P	80 - 120
2362992	Arsenic	100	101	P/P	80 - 120
2362992	Barium	100	101	P/P	80 - 120
2362992	Beryllium	88.4	93.3	P/P	80 - 120
2362992	Boron	102	101	P/P	80 - 120
2362992	Cadmium	96.6	97.6	P/P	80 - 120
2362992	Chromium	94.9	95.3	P/P	80 - 120
2362992	Cobalt	94.9	94.7	P/P	80 - 120
2362992	Copper	96.5	96.5	P/P	80 - 120
2362992	Lead	93.3	93.1	P/P	80 - 120
2362992	Manganese	95.7	95.2	P/P	80 - 120
2362992	Molybdenum	97.0	96.3	P/P	80 - 120
2362992	Nickel	96.1	97.0	P/P	80 - 120
2362992	Selenium	92.2	95.3	P/P	80 - 120
2362992	Silver	100	99.4	P/P	80 - 120
2362992	Thallium	97.8	98.5	P/P	80 - 120
2363965	Aluminum	94.9		P	80 - 120
2363965	Antimony	99.4		P	80 - 120
2363965	Arsenic	100		P	80 - 120
2363965	Barium	102		P	80 - 120
2363965	Beryllium	89.7		P	80 - 120
2363965	Boron	102		P	80 - 120
2363965	Cadmium	98.2		P	80 - 120
2363965	Chromium	96.7		P	80 - 120
2363965	Cobalt	93.9		P	80 - 120
2363965	Copper	95.3		P	80 - 120

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363965	Lead	94.1		P	80 - 120
2363965	Manganese	95.0		P	80 - 120
2363965	Molybdenum	96.0		P	80 - 120
2363965	Nickel	96.8		P	80 - 120
2363965	Selenium	93.0		P	80 - 120
2363965	Silver	100		P	80 - 120
2363965	Thallium	98.8		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363953	Chloride	97.5		P	90 - 110
2364013	Chloride	98.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363953	Sulfate	107		P	90 - 110
2364012	Sulfate	103		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363981	Ammonia-N	98.0	98.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363891	Kjeldahl Nitrogen	103	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421528

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363981	NO2NO3-N	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421344

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2364014	Total-P	101	101	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363953	Fluoride	99.3	100	P/P	94 - 104

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-2011
Batch ID: P421543

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2363956	Organic Carbon	98.8	98.5	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: DEP SOP: NU-094-1
Batch ID: P421193

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363980	Color (true)	0.498	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P421207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363980	Turbidity	3.43	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P421233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362992	Calcium	1.13	Spike	P	0 - 20
2362992	Iron	1.07	Spike	P	0 - 20
2362992	Magnesium	1.34	Spike	P	0 - 20
2362992	Potassium	0.267	Spike	P	0 - 20
2362992	Sodium	0.436	Spike	P	0 - 20
2362992	Strontium	0.0787	Spike	P	0 - 20
2362992	Tin	3.03	Spike	P	0 - 20
2362992	Titanium	3.48	Spike	P	0 - 20
2362992	Vanadium	3.49	Spike	P	0 - 20
2362992	Zinc	3.18	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P421233

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2362992	Aluminum	0.980	Spike	P	0 - 20
2362992	Antimony	0.0265	Spike	P	0 - 20
2362992	Arsenic	0.316	Spike	P	0 - 20
2362992	Barium	0.689	Spike	P	0 - 20
2362992	Beryllium	4.53	Spike	P	0 - 20
2362992	Boron	0.707	Spike	P	0 - 20
2362992	Cadmium	1.03	Spike	P	0 - 20
2362992	Chromium	0.422	Spike	P	0 - 20
2362992	Cobalt	0.208	Spike	P	0 - 20
2362992	Copper	0.0488	Spike	P	0 - 20
2362992	Lead	0.201	Spike	P	0 - 20
2362992	Manganese	0.424	Spike	P	0 - 20
2362992	Molybdenum	0.723	Spike	P	0 - 20
2362992	Nickel	0.874	Spike	P	0 - 20
2362992	Selenium	3.33	Spike	P	0 - 20
2362992	Silver	0.871	Spike	P	0 - 20
2362992	Thallium	0.793	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421654

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Chloride	0.629	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P421823

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Sulfate	1.01	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P421858

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363981	Ammonia-N	0.346	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P421505

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363891	Kjeldahl Nitrogen	3.88	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P421528

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363981	NO2NO3-N	0.482	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P421344

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2364014	Total-P	0.679	Spike	P	0 - 20

Reference Method: SM 2320 B-2011
Batch ID: P421457

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Total Alkalinity	1.76	Sample	P	0 - 3.8

Reference Method: SM 2540 C-2015
Batch ID: P421735

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363803	TDS	6.09	Sample	P	0 - 10

Quality Assurance Report
Precision

Reference Method: SM 4500-F- C-2011
Batch ID: P421906

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363953	Fluoride	0.470	Spike	P	0 - 1.6

Reference Method: SM 5310 B-2011
Batch ID: P421543

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2363956	Organic Carbon	0.304	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Calibration Verification

Reference Method: DEP SOP: NU-094-1
Run ID: A115432
Included Lab Sample IDs: 2363980, 2363982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	98.8	99.7	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A115436
Included Lab Sample IDs: 2363980, 2363982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	98.5	99.0	P/P	95 - 105

Reference Method: EPA 200.8 Rev. 5.4
Run ID: A115490
Included Lab Sample IDs: 2363986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.1	94.3	P/P	90 - 110
Antimony	94.6	95.5	P/P	90 - 110
Arsenic	97.4	96.7	P/P	90 - 110
Barium	96.1	95.7	P/P	90 - 110
Beryllium	95.0	95.3	P/P	90 - 110
Boron	94.4	98.8	P/P	90 - 110
Cadmium	96.1	96.5	P/P	90 - 110
Chromium	92.0	91.9	P/P	90 - 110
Cobalt	90.9	91.0	P/P	90 - 110
Copper	92.1	92.9	P/P	90 - 110
Lead	91.0	90.7	P/P	90 - 110
Manganese	92.1	92.1	P/P	90 - 110
Molybdenum	95.5	96.1	P/P	90 - 110
Nickel	92.3	92.5	P/P	90 - 110
Selenium	93.6	95.6	P/P	90 - 110
Silver	97.1	97.2	P/P	90 - 110
Thallium	95.7	95.1	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115496
Included Lab Sample IDs: 2363986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	93.2	96.2	P/P	90 - 110
Iron	93.7	96.3	P/P	90 - 110
Magnesium	93.9	96.6	P/P	90 - 110
Potassium	93.6	96.9	P/P	90 - 110
Sodium	92.7	95.4	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115528
Included Lab Sample IDs: 2363986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Strontium	94.6	91.7	P/P	90 - 110
Tin	94.5	94.3	P/P	90 - 110
Titanium	93.5	92.1	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4
Run ID: A115528
Included Lab Sample IDs: 2363986

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Vanadium	93.5	91.8	P/P	90 - 110
Zinc	93.3	92.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115530
Included Lab Sample IDs: 2363981

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	100	96.8	P/P	90 - 110

Reference Method: SM 2320 B-2011
Run ID: A115538
Included Lab Sample IDs: 2363980, 2363982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	96.5	99.1	P/P	90 - 110
Total Alkalinity	99.1	95.4	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A115542
Included Lab Sample IDs: 2363983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	103	104	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115558
Included Lab Sample IDs: 2363980, 2363982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	98.1	98.4	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A115564
Included Lab Sample IDs: 2363981, 2363983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	104	102	P/P	90 - 110

Reference Method: SM 5310 B-2011
Run ID: A115572
Included Lab Sample IDs: 2363981, 2363983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	97.4	98.6	P/P	90 - 110
Organic Carbon	97.6	99.0	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A115618
Included Lab Sample IDs: 2363981, 2363983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	98.6	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A115675
Included Lab Sample IDs: 2363980, 2363982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	100	104	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A115726
Included Lab Sample IDs: 2363981, 2363983

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.3	98.6	P/P	90 - 110

Reference Method: SM 4500-F- C-2011
Run ID: A115743
Included Lab Sample IDs: 2363980, 2363982

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	102	99.5	P/P	90 - 110
Fluoride	99.5	99.5	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision		
						LCS	SMP	MS
DEP SOP: NU-094-1	Color (true)	97.9					0.498	
EPA 180.1 Rev. 2.0	Turbidity	99.1					3.43	
EPA 200.7 Rev. 4.4	Calcium	104	101	102	107			1.13
	Iron	105	103	104	108			1.07
	Magnesium	105	104	105	111			1.34
	Potassium	104	100	101	107			0.267
	Sodium	96.9	94.6	107				0.436
	Strontium	106	104	104	101			0.0787
	Tin	104	102	105	103			3.03
	Titanium	100	99.5	103	98.4			3.48
	Vanadium	99.9	99.7	103	97.6			3.49
	Zinc	99.8	98.9	102	98.5			3.18
EPA 200.8 Rev. 5.4	Aluminum	93.7	93.7	92.8	94.9			0.980
	Antimony	98.4	99.1	99.1	99.4			0.0265
	Arsenic	101	100	101	100			0.316
	Barium	101	100	101	102			0.689
	Beryllium	91.7	88.4	93.3	89.7			4.53
	Boron	99.6	102	101	102			0.707
	Cadmium	96.7	96.6	97.6	98.2			1.03
	Chromium	95.6	94.9	95.3	96.7			0.422
	Cobalt	94.1	94.9	94.7	93.9			0.208
	Copper	95.5	96.5	96.5	95.3			0.0488
	Lead	93.0	93.3	93.1	94.1			0.201
	Manganese	95.4	95.7	95.2	95.0			0.424
	Molybdenum	95.2	97.0	96.3	96.0			0.723
	Nickel	95.5	96.1	97.0	96.8			0.874
	Selenium	97.0	92.2	95.3	93.0			3.33
	Silver	100	100	99.4	100			0.871
	Thallium	97.8	97.8	98.5	98.8			0.793
EPA 300.0 Rev. 2.1	Chloride	102	97.5	98.3			0.629	
	Sulfate	103	107	103			1.01	
EPA 350.1 Rev. 2.0	Ammonia-N	97.8	98.0	98.4				0.346
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	103	98.4				3.88
EPA 353.2 Rev. 2.0	NO2NO3-N	104	104	104				0.482
EPA 365.1 Rev. 2.0	Total-P	104	101	101				0.679
SM 2320 B-2011	Total Alkalinity	99.0					1.76	
SM 2540 C-2015	TDS	97.9					6.09	
SM 2540 D-2015	TSS	96.5						
SM 4500-F- C-2011	Fluoride	100	99.3	100				0.470
SM 5310 B-2011	Organic Carbon	97.8	98.8	98.5				0.304

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: NU-094-1	True Color measured at 450 nm (not valid for NPDES monitoring)	2363980, 2363982
EPA 180.1 Rev. 2.0	Turbidity in aqueous matrices	2363980, 2363982
EPA 200.7 Rev. 4.4	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2363986
EPA 200.8 Rev. 5.4	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2363986
EPA 300.0 Rev. 2.1	Chloride in aqueous matrices	2363980, 2363982
EPA 300.0 Rev. 2.1	Sulfate in aqueous matrices	2363980, 2363982
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2363981, 2363983

Reference Method Descriptions

Method	Description	Associated Samples
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2363981, 2363983
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2363981, 2363983
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2363981, 2363983
SM 2320 B-2011	Alkalinity in aqueous matrices as mg CaCO3/L	2363980, 2363982
SM 2340 B-2011	Hardness by calculation, in aqueous matrices, reported as mg/L CaCO3	2363986
SM 2540 C-2015	Total Dissolved Solids in aqueous matrices	2363980, 2363982
SM 2540 D-2015	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2363980, 2363982
SM 4500-F- C-2011	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2363980, 2363982
SM 5310 B-2011	Nonpurgeable Organic Carbon in aqueous matrices	2363981, 2363983

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: NU-094-1	10/20/2022			10/20/2022 14:03	Anna M. Plaviak	2363980
	10/20/2022			10/20/2022 14:04	Anna M. Plaviak	2363982
EPA 180.1 Rev. 2.0	10/20/2022			10/20/2022 14:15	Chandler E Cox	2363980
	10/20/2022			10/20/2022 14:16	Chandler E Cox	2363982
EPA 200.7 Rev. 4.4	10/20/2022	10/21/2022 11:20	George D Taylor	10/25/2022 01:50	McKinley C Carter	2363986
	10/20/2022	10/21/2022 11:20	George D Taylor	10/25/2022 20:15	McKinley C Carter	2363986
EPA 200.8 Rev. 5.4	10/20/2022	10/21/2022 11:20	George D Taylor	10/24/2022 22:16	Emily M Philpot	2363986
EPA 300.0 Rev. 2.1	10/20/2022			10/29/2022 05:46	Anna M. Plaviak	2363980
	10/20/2022			10/29/2022 06:01	Anna M. Plaviak	2363982
	10/20/2022			11/02/2022 20:17	Anna M. Plaviak	2363980
	10/20/2022			11/02/2022 20:32	Anna M. Plaviak	2363982
EPA 350.1 Rev. 2.0	10/20/2022			11/03/2022 13:11	Ping Hua	2363981
	10/20/2022			11/03/2022 13:12	Ping Hua	2363983
EPA 351.2 Rev. 2.0	10/20/2022	10/27/2022 11:24	Alexandra J Mattheus	10/28/2022 13:54	Alexandra J Mattheus	2363981
	10/20/2022	10/27/2022 11:24	Alexandra J Mattheus	10/28/2022 13:56	Alexandra J Mattheus	2363983
EPA 353.2 Rev. 2.0	10/20/2022			10/27/2022 10:00	Beverly Y. Sanders	2363981
	10/20/2022			10/27/2022 10:12	Beverly Y. Sanders	2363983
EPA 365.1 Rev. 2.0	10/20/2022	10/25/2022 12:45	Simonne.V. Calhoun	10/26/2022 10:25	James L Waggerby	2363981
	10/20/2022	10/25/2022 12:45	Simonne.V. Calhoun	10/26/2022 13:45	Simonne.V. Calhoun	2363983
SM 2320 B-2011	10/20/2022			10/25/2022 23:17	Adam P Silver	2363982
	10/20/2022			10/26/2022 02:56	Adam P Silver	2363980
SM 2340 B-2011	10/20/2022			10/25/2022 01:50	McKinley C Carter	2363986
SM 2540 C-2015	10/20/2022			10/21/2022 17:06	Yijie Li	2363980, 2363982
SM 2540 D-2015	10/20/2022			10/21/2022 17:06	Yijie Li	2363980, 2363982
SM 4500-F- C-2011	10/20/2022			11/04/2022 07:41	Dale L. Simmons	2363982
	10/20/2022			11/04/2022 09:08	Dale L. Simmons	2363980
SM 5310 B-2011	10/20/2022			10/26/2022 16:52	Khloe J Berg	2363981
	10/20/2022			10/26/2022 22:13	Khloe J Berg	2363983